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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/657,794	09/08/2000	Christopher P. Laurello	102094-100	3235

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WIGGIN & DANA LLP
ATTENTION: PATENT DOCKETING
ONE CENTURY TOWER, P.O. BOX 1832
NEW HAVEN, CT 06508-1832

EXAMINER

LAVILLA, MICHAEL E

ART UNIT	PAPER NUMBER
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1775

DATE MAILED: 09/25/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.
09/657,794

Applicant(s)
LAURELLO ET AL.

Examiner
LA VILLA

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE three MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Aug 12, 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-41 is/are pending in the application.
- 4a) Of the above, claim(s) 24-41 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 1,2 6) ☐ Other:

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Claims 1-23, Group I, in Paper No. 7 is acknowledged.

Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

2. The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:
4. The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.
5. Claims 1-12 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The Specification teaches that antitarnish properties of the coated substrate require heat treatment of a laminate comprised of at least a substrate, layer of antitarnish agent, and tin layer, whereby the heat treatment causes the layer of antitarnish agent to diffuse into the tin layer and confer an antitarnish property to the outer surface of the resulting coated substrate. See Summary of the Invention at pages 4-6 and elsewhere. Therefore, the applicant has not taught how one of ordinary skill in

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the art could confer antitarnish property to the outer surface of the resulting laminate absent the necessary heat treatment process.

6. Claims 1-12 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for substrates that are heat tolerant and diffusion resistant as compared to the outer tin layer, does not reasonably provide enablement for any substrate. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to practice the invention commensurate in scope with these claims. Applicant has not taught how one of ordinary skill in the art could achieve the antitarnish effect for any substrate. Rather, the substrate material must be able to withstand the heat treatment and must resist diffusion of the layer of antitarnish agent as compared to diffusion into the tin layer. Applicant has taught how specific materials meet these requirements, but has not taught how any substrate is satisfactory, which is what is claimed.
7. The following is a quotation of the second paragraph of 35 U.S.C. 112:
8. The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
9. Claims 1-23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- I. Regarding Claims 1-12, it is unclear what is meant by the phrase "antitarnish layer." In view of applicant's disclosure, a layer merely

disposed underneath the outer layer cannot prevent tarnishing of the coated substrate. It is therefore unclear what is claimed. Is applicant claiming a structure which can be heat treated to provide a tarnish protected outer layer. It is unclear what constitutes the claimed antitarnish function. What is the baseline degree of tarnishing that is to be avoided?

- II. Regarding Claims 13-23, it is unclear what is meant by the phrase "concentration gradient" in view of the further mentioning of "highest concentration of said antitarnish agent." Applicant's definition of the term "concentration gradient" at the bottom of page 7 and top of page 8 encompasses concentration gradients of zero. Therefore, it is unclear whether the claimed articles can possess zero gradient distribution of diffused antitarnish agent.
- III. Regarding Claim 11, it is unclear what is the antecedent basis of the phrase "said coating." It is also unclear how the bilayered structure persists after the heat treatment.
- IV. Regarding Claims 2, 9, 14, 20, it is unclear what distinguishes a "combination" from an "alloy." It is unclear whether there is any

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significance in the distinction between the phrases “and combinations and alloys thereof” and “and combinations or alloys thereof.”

V. Regarding Claims 14 and 19, it is unclear what is the antecedent basis of the phrase “said antitarnish layer.”

VI. Regarding Claim 21, it is unclear what is the antecedent basis of the phrase “said outer layer.”

VII. Regarding Claim 22, it is unclear what is meant by the phrase “is in a heat treated condition.” Does this mean something other than the already described “diffused” state of antitarnish agent?

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

11. A person shall be entitled to a patent unless –

12. (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

13. (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

14. The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or

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(2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

15. Claims 1, 3-7, 13, and 15-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Yoshiaki et al. JP 9-291394. Yoshiaki et al. teaches an aluminum material coated with tin, wherein there is a gradient concentration of aluminum such that the concentration of aluminum is lowest toward the surface level (see Abstract; and paragraphs 7-9 in Detailed Description of Yoshiaki). In view of the gradient in concentration, the claimed thicknesses and weight percentages are inherently present as the layers can be demarcated in any manner that satisfies these claimed features.

16. Claims 13-15, 21, and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Guenin USP 5,028,492. Guenin teaches copper substrates coated with tin/indium layers having greater than 90% tin by weight and having PTFE, wherein the composite coating has a thickness of 1 to 3 microns (see col. 3, line 50 through col. 6, line 33; Claims 1 and 7-10 in Guenin). Guenin teaches a zero gradient tin layer.

17. Claims 1, 2, 6, 7, 12, 13, 14, 15, and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Cavallotti et al. USP 5,759,379. Cavallotti et al. teaches a

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copper substrate coated with a thin zinc layer further coated with a tin or tin alloy layer. The zinc layer can serve as the claimed antitarnish layer. Cavallotti teaches that this composite can be heat treated, resulting in diffusion of zinc into the tin layer (see col. 2, line 23 through col. 4, line 37 in Cavallotti).

18. Claims 1-3, 6, 7, 12, 13-18, and 23 are rejected under 35 U.S.C. 102(e) as being anticipated by Kodama et al. USP 6,403,234. Kodama teaches a copper substrate coated with a nickel/phosphorus layer which is further coated with a tin alloy layer; the laminate can be heated to diffuse the nickel and phosphorus into the tin layer; the phosphorus layer is exemplified as 2000 Å thick or greater and the phosphorus composition of the diffusion treated coating is 0.02 wt.% (see Abstract; col. 2, line 18 through col. 4, line 10; Tables 1 and 2; and Claims in Kodama et al.).

Claim Rejections - 35 USC § 103

19. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

- (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

20. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

21. Claims 1-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Fister et al. USP 5,916,695 in view of Guenin USP 5,028,492. Fister teaches a copper substrate coated with a copper flash layer, a zinc containing barrier layer and a tin alloy layer, wherein the tin alloy layer may be one of the materials disclosed by Guenin and wherein the tin layer may further comprise lubricant (see Abstract; col. 2, line 60 through col. 3, line 59; col. 4, line 62; through col. 5, line 27; col. 6, lines 50-56; and Claims in Fister et al.) Fister may not exemplify using a flash layer. It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize a 2 microinch flash layer in the laminate of Fister in order to provide an initial leveling layer for the substrate. It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate any of the ternary elements in the barrier layer of Fister, including zinc or phosphorus, as Fister teaches that these elements to minimize intermetallic formation. Guenin teaches copper substrates coated with tin/indium layers having greater than 90% tin by weight and having PTFE, wherein the composite coating has a thickness of 1 to 3 microns (see col. 3, line 50 through

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col. 6, line 33; Claims 1 and 7-10 in Guenin). Guenin teaches a zero gradient tin layer. It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the tin/indium alloys of Guenin in the laminates of Fister as Fister teaches that utilization of these alloys achieves effective tin coated electrical conductors. Guenin does not exemplify coatings having nearly pure tin, but does teach that greater than 90% tin and close to pure tin layers are preferred. It would have been obvious to one of ordinary skill in the art at the time of the invention to fabricate a coating having close to 100% tin with slight indium impurity as Guenin teaches that layers of this composition are effective. Guenin does not exemplify coatings having the claimed COF, but does teach that fretting degradation is to be avoided by incorporating lubricant component in the outer coating layer. It would have been obvious to one of ordinary skill in the art at the time of the invention to vary the amount and composition of the lubricant in the outer layer of Guenin in order to minimize the fretting degradation as Guenin teaches this variation in Table 1. The claimed COF would be expected to be inherently achieved.

22. Claims 13-18, 21, 22, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guenin USP 5,028,492. Guenin teaches copper substrates coated with tin/indium layers having greater than 90% tin by weight and having PTFE, wherein the composite coating has a thickness of 1 to 3 microns (see col. 3, line 50 through col. 6, line 33; Claims 1 and 7-10 in Guenin). Guenin teaches a zero gradient tin layer. Guenin does not exemplify coatings having nearly pure

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tin, but does teach that greater than 90% tin and close to pure tin layers are preferred. It would have been obvious to one of ordinary skill in the art at the time of the invention to fabricate a coating having close to 100% tin with slight indium impurity as Guenin teaches that layers of this composition are effective. Guenin does not exemplify coatings having the claimed COF, but does teach that fretting degradation is to be avoided by incorporating lubricant component in the outer coating layer. It would have been obvious to one of ordinary skill in the art at the time of the invention to vary the amount and composition of the lubricant in the outer layer of Guenin in order to minimize the fretting degradation as Guenin teaches this variation in Table 1. The claimed COF would be expected to be inherently achieved.

23. Claims 3-5 and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cavallotti et al. USP 5,759,379. Cavallotti et al. teaches a copper substrate coated with a thin zinc layer further coated with a tin or tin alloy layer. The zinc layer can serve as the claimed antitarnish layer. Cavallotti teaches that this composite can be heat treated, resulting in diffusion of zinc into the tin layer (see col. 2, line 23 through col. 4, line 37 in Cavallotti). Cavallotti does not exemplify the claimed thickness of zinc layer, but teaches that it is less than 0.5 microinches or 0.1 microinches and that it can be 100 times thinner than the overlaying tin layer. It would have been obvious to one of ordinary skill in the art at the time of the invention to fabricate the zinc layer in a thickness of 0.5 or 0.1 microinches and to fabricate the zinc layer so that it is 100 times thinner than the

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tin layer before heat treatment since Cavallotti teaches that such laminates are effective for providing for good electrical contacts. The laminates constructed in this manner would be expected to obtain the claimed zinc layer thickness and zinc weight percentage incorporation in the overlying tin layer. In view of the gradient in concentration, the claimed thicknesses and weight percentages are inherently present as the layers can be demarcated in any manner that satisfies these claimed features.

24. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael La Villa whose telephone number is (703) 308-4428. The examiner can normally be reached on Mondays and Tuesdays.

25. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on (703) 308-3822. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

26. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Michael La Villa
September 23, 2002

A handwritten signature in black ink, appearing to read 'M. La Villa', with a long horizontal line extending to the right.